



PAM-2500 High-performance Field and Laboratory Chlorophyll Fluorometer

DESCRIPTION

The PAM-2500 chlorophyll fluorometers are successors of the well-known PAM-2000/2100 instruments which were introduced in the 1990s as the first portable PAM fluorometers. Since then they have been successfully applied worldwide by numerous scientists.

In the development of the PAM-2500, particular care was taken to maintain all properties appreciated by PAM-2000/2100 users and, at the same time, to integrate state-of-the-art technology.

Essentially, the hardware and optical system are thoroughly modernized. Also, while continuing basic elements of the graphical user interface, instrument operation is based on the newly-developed PamWin-3 software.

The program permits operation under Windows operating systems on normal personal computers, but also on ultra mobile touch screen computers (UMPC).



PAM-2500

Major Points of Progress of the PAM-2500

- Saturation pulse as well as polyphasic rise analysis with time resolution down to 10 μ s
- Latest generation light-emitting diodes for all internal light sources
- High sensitivity enabling high quality measurements with dilute suspensions of algae and cyanobacteria

The PAM-2500 chlorophyll fluorometer is an extremely compact and powerful measuring system. All optical and electronic components are located in a 23 cm x 10.5 cm x 10.5 cm housing.

The light sources of the PAM-2500 are light-emitting diodes (LEDs) permitting quasi-rectangular light intensity changes.

The PAM-2500 employs measuring light of 630 nm consisting of 1 μ s pulses given at frequencies from 10 Hz to 200 kHz. Strong red actinic light of 630 nm is provided by a Chip-On-Board LED array. The fluorometer also features a blue actinic light source having the peak emission at 455 nm. In addition, a far-red LED with peak at 750 nm permits selective excitation of PS I.

ACCESSORIES

- Ultra Mobile Computer UMPC and Battery for Field Studies
- Fiberoptics Holder for Surfaces 2060-A
- Mini-Quantum/Temp.-Sensor 2060-M
- Leaf Clip DLC-8
- Light and Temperature-sensing, Leaf Clip 2030-B
- Arabidopsis Leaf Clip 2060-B
- Leaf Positioning Device DUAL-BA
- Magnetic Stirrer with Fiberoptics Holder MKS-2500

Features & Configurations

Measuring Principle & Quenching Analysis

- The PAM-2500 chlorophyll fluorometers employs pulse-amplitude-modulated (PAM) measuring light to excite chlorophyll fluorescence. The intensity of the PAM excitation light can be sufficiently low for monitoring fluorescence yield without affecting the state of photosynthesis. The resulting modulated chlorophyll fluorescence is detected with high sensitivity and selectivity, but the fluorometer is virtually insensitive to even strong unmodulated light like full sunlight or saturation pulses at up to $25,000 \mu\text{mol m}^{-2} \text{s}^{-1}$.
- In addition to the current fluorescence yield in continuous light (F_t) and the maximum yield during saturation pulses (F_m or F_m') it is also possible to determine the minimum yield after dark-acclimation (F_o) or in illuminated state (F_o'). The PamWin-3 software calculates automatically four quenching coefficients (q_P , q_L , q_N , and NPQ), the effective yield of PS II photochemistry ($Y(II)=\Delta F/F_m'$) and the complementary yields of non-photochemical energy dissipation ($Y(NO)$ and $Y(NPQ)$) as well as the apparent electron transport rate (ETR).

The PAM-2500 chlorophyll fluorometer can be configured for measurements of leaves and suspensions. In both cases, a flexible optical fiber guides modulated measuring light as well as actinic light to the sample, and collects the chlorophyll fluorescence.

Independent of configuration, the use of power LEDs results in high actinic intensities of up to $2000 \mu\text{mol m}^{-2} \text{s}^{-1}$ and single turn-over flash intensities up to $125,000 \mu\text{mol m}^{-2} \text{s}^{-1}$ at sample level. Additionally, the PAM-2500 features blue actinic light up to $800 \mu\text{mol m}^{-2} \text{s}^{-1}$ and an efficient far red light source.

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Application

- Light Saturation Curves of the Apparent Electron Transport Rate
- Polyphasic Fluorescence Rise Upon Onset of Saturating Light
- Measuring the dark-acclimated sample

This Instrument is manufactured by our principle company

WALZ - Germany